

Exhibit A – Technical Energy Audit & Project Proposal Contract Scope of Work

- 1) Data and Information.** Collect data and background information from State concerning facility operation and energy use for the most recent three years from the effective date of this Contract as follows:
 - a. Building square footage.
 - b. Construction data of buildings and major additions including building envelope.
 - c. Utility company invoices.
 - d. Occupancy and usage information.
 - e. Description of all energy-consuming or energy-saving equipment used on the premises.
 - f. Description of energy management procedures utilized on the premises.
 - g. Description of any energy-related improvements made or currently being implemented.
 - h. Description of any changes in the structure of the facility or energy-using or water-using equipment.
 - i. Description of future plans regarding building modifications or equipment modifications and replacements.
 - j. Drawings, as available (may include mechanical, plumbing, electrical, building automation and temperature controls, structural, architectural, modifications and remodels).
 - k. Original construction submittals and factory data (specifications, pump curves, etc.), as available.
 - l. Operating engineer logs, maintenance work orders, etc., as available.
 - m. Records of maintenance expenditures on energy-using equipment, including service contracts.
 - n. Prior energy audits or studies, if any.
- 2) Identify Potential Measures**
 - a. Interview individuals with knowledge of the facility such as the facility manager, maintenance staff, subcontractors and occupants of each building regarding:
 - i. Facility operation, including energy management procedures.
 - ii. Equipment maintenance problems.
 - iii. Comfort problems and requirements.
 - iv. Equipment reliability.
 - v. Projected equipment needs.
 - vi. Occupancy and use schedules for the facility and specific equipment.
 - vii. Facility improvements – past, planned and desired.
 - b. Survey major energy-using equipment, including, but not limited to, lighting (indoor and outdoor), heating and heat distribution systems, cooling systems and related equipment, automatic temperature control systems and equipment, air distribution systems and equipment, outdoor ventilation systems and equipment; exhaust systems and equipment; hot water systems, electric motors, transmission and drive systems, special systems such as kitchen/dining equipment and swimming pools, renewable energy systems, other energy using systems, water consuming systems, such as restroom fixtures, water fountains, and irrigation systems.
 - c. Perform "late-night" surveys outside of normal business hours or on weekends to confirm building system and occupancy schedules, if deemed necessary.
 - d. Develop a preliminary list of potential energy and water saving measures. Consider the following for each system:
 - i. Comfort and maintenance problems.
 - ii. Energy use, loads, proper sizing, efficiencies and hours of operation.

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- iii. Current operating condition.
 - iv. Remaining useful life.
 - v. Feasibility of system replacement.
 - vi. Hazardous materials and other environmental concerns.
 - vii. State's future plans for equipment replacement or building renovations.
 - viii. Facility operation and maintenance procedures that could be affected.
 - ix. Capability to monitor energy performance and verify savings.
- 3) **Base-Year Consumption.** Establish base-year consumption and reconcile with end-use consumption estimates.
 - a. Establish appropriate base year consumption by examining utility bills for the past three years for electricity, gas, propane, steam, water, and any other applicable utilities. Present base year consumption in terms of energy units (kWh, kW, ccf, Therms, gallons, or other units used in bills), in terms of energy units per square foot, in terms of dollars, and in terms of dollars per square foot. Describe the process used to determine the base year (averaging, selecting most representative contiguous 12 months, removal of anomalies, or other statistical or weather-normalized method). Consult with facility personnel to account for any anomalous schedule or operating conditions on billings that could skew the base year representation. Contractor shall account for periods of time when equipment was broken or malfunctioning in calculating the base year.
 - b. Estimate loading, usage and/or hours of operation for all major end uses of total facility consumption including, but not limited to: lighting, heating, cooling, motors (fans, pumps, and other pertinent), plug loads, and other major energy and water using equipment. Where loading or usage are highly uncertain (including variable loads such as cooling), Contractor shall use its best judgment, spot measurements or short-term monitoring. Contractor should not assume that equipment run hours equal the operating hours of the building(s) or facility staff estimates.
 - c. Reconcile annual end-use estimated consumption with the annual base year consumption. This reconciliation shall place reasonable "real-world" limits on potential savings. Propose adjustments to the baseline for energy and water saving measures that shall be implemented in the future.
 - d. For facilities constructed and occupied prior to July 1, 2005, establish the actual FY 2005/2006 baseline utility consumption and compare to the EPC base year consumption. Document, analyze, and defend all variances between the EPC base year consumption values and the actual FY 2005/2006 facility baseline utility consumption.
- 4) **Preliminary Analysis.** Develop a preliminary analysis of potential energy and water saving measures.
 - a. List all potential opportunities, whether cost-effective or not. Consider technologies in a comprehensive approach including, but not limited to: lighting and daylighting systems, heating/ventilating/air conditioning equipment and distribution systems, controls systems, building envelope, motors, kitchen equipment, pools, renewable energy systems, other special equipment, irrigation systems, and water saving devices.
 - b. Identify measures which appear likely to be cost effective and therefore warrant detailed analysis.
 - c. For each measure, prepare a preliminary estimate of energy or water cost savings including description of analysis methodology, supporting calculations and assumptions used to estimate savings.

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- 5) Preliminary Meeting.** Meet with State to present preliminary analysis prior to complete analysis. Describe how the projected project economics meet the State's terms for completing the Technical Energy Audit and Proposal Contract. Discuss assessment of energy use, savings potential, project opportunities, and potential for developing an energy performance contract. Develop a list of recommended measures for further analysis. The State shall at its discretion, have the option to reject any presented calculations of savings, potential savings allowed, or project recommendations.
- 6) Savings and Cost Analysis.** Analyze savings and costs for each mutually agreed to energy and water saving measure and any mutually agreed to capital improvement measures.
 - a.** Follow the methodology of the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) or other nationally-recognized authorities following the engineering principle(s) identified for each retrofit option.
 - b.** Utilize assumptions, projections and baselines which best represent the true value of future energy or operational savings. Include accurate marginal costs for each unit of savings at the time the audit is performed, documentation of material and labor cost savings, adjustments to the baseline to reflect current conditions at the facility, calculations which account for the interactive effects of the recommended measures.
 - c.** Use best judgment regarding the employment of instrumentation and recording durations so as to achieve an accurate and faithful characterization of energy use.
 - d.** Use markups and fees stated in contract in all cost estimates.
 - e.** Develop a preliminary measurement and verification plan for each measure.
 - f.** Follow additional guidelines for analysis and report preparation given below.
 - g.** Include cost to provide services and complete application for ENERGY STAR Label, LEED-EB certification for Existing Buildings, or other certification.
- 7) Draft Audit Report.** Prepare a draft Technical Energy Audit Report. The report provides an engineering and economic basis for negotiating a potential Energy Performance Contract between the State and the Contractor. The report shall include:
 - a.** Overview.
 - i.** Contact information.
 - ii.** Summary table of recommended energy and water saving measures, with itemization for each measure of total design and construction cost, annual maintenance costs, the first year cost avoidance (in dollars and energy/water units), simple payback and equipment service life.
 - iii.** Summary of annual energy and water use by fuel type and costs of existing or base year condition.
 - iv.** Calculation of cost savings expected if all recommended measures are implemented and total percentage savings of total facility energy cost.
 - v.** Description of the existing facility, mechanical and electrical systems.
 - vi.** Summary description of measures, including estimated costs and savings for each as detailed above.
 - vii.** Discussion of measures considered but not investigated in detail.
 - viii.** Conclusions and recommendations.
 - b.** Base year energy use.
 - i.** Description and itemization of current billing rates, including schedules and riders.
 - ii.** Summary of all utility bills for all fuel types and water.

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- iii. Identification and definition of base year consumption and description of how established.
- iv. Reconciliation of estimated end use consumption (i.e. lighting, cooling, heating, fans, plug loads, etc) with base year (include discussion of any unusual findings)
- c. Full description of each energy and water saving measure including:
 - i. Written description of:
 - A. Existing conditions.
 - B. Description of equipment to be installed and how it shall function.
 - C. Include discussion of facility operations and maintenance procedures that shall be affected by installation/implementation.
 - D. Present the plan for installing or implementing the recommendation.
 - ii. Savings calculations:
 - A. Base year energy use and cost.
 - B. Post-retrofit energy use and cost.
 - C. Savings estimates including analysis methodology, supporting calculations and assumptions used.
 - D. Annual savings estimates. The cost savings for all energy saving measures must be determined for each year during the contract period. Savings must be able to be achieved each year (cannot report average annual savings over the term of the contract).
 - E. Savings must be limited to savings allowed by the State as described above.
 - F. Percent cost-avoidance projected.
 - G. Description and calculations for any proposed rate changes.
 - H. Explanation of how savings interactions between retrofit options is accounted for in calculations.
 - I. Operation and maintenance savings, including detailed calculations and description. Ensure that maintenance savings are only applied in the applicable years and only during the lifetime of the particular equipment.
 - J. If computer simulation is used, include a short description and state key input data. If requested by State, access shall be provided to the program and all assumptions and inputs used, and/or printouts shall be provided of all input files and important output files and included in the Technical Energy Audit with documentation that explains how the final savings figures are derived from the simulation program output printouts.
 - K. If manual calculations are employed, formulas, assumptions and key data shall be stated.
 - L. Conclusions, observations, caveats.
- iii. Cost estimate – Include all information required under CRS §24-30-2002 as well as a detailed scope of the construction work suitable for cost estimating. Include all anticipated costs associated with installation and implementation. Provide preliminary specifications for major mechanical components as well as detailed lighting and water fixture counts. The following shall also be included:
 - A. Engineering/design costs.
 - B. Contractor/vendor estimates for labor, materials, and equipment; include special provisions, overtime, and all other appropriate items, as needed to

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accomplish the work with minimum disruption to the operations of the facilities.

C. Permit costs.

D. Construction management fees.

E. Environmental costs or benefits (disposal, avoided emissions, handling of hazardous materials, and any other related costs).

F. Note that all markups and fees stated in **Exhibit D** to the Technical Energy Audit and Project Proposal Contract (TEAPP) to which this Exhibit A is attached, shall be used in the cost estimates, unless otherwise documented and justified due to change in scope or size of project or other unforeseen circumstances.

G. Conclusions, observations, caveats.

H. Other cost categories as defined above under “markups” in Contract.

d. Miscellaneous:

i. Estimate of average useful service life of equipment.

ii. Preliminary commissioning plan.

iii. Preliminary measurement and verification plan, following the International Performance Measurement and Verification Protocol most current International Performance Monitoring and Verification Protocol (IPMVP), explaining how savings from each measure is to be measured and verified.

iv. Discussion of impacts that facility would incur after contract ends. Consider operation and maintenance impacts, staffing impacts, budget impacts, etc., and identify who is responsible for maintenance.

v. Compatibility with existing systems.

8) Post-Audit Meeting. Meet with State to review the recommendations, savings calculations and impact of the measures on the operations of the facility. Describe how the projected project economics meet the State’s terms for completing the Technical Energy Audit and Performance Contract Proposal. Discuss the willingness and capability of State to make capital contributions to the project to improve the economics of the overall project. Revise Audit as directed by State.

9) Complete and Present Final Technical Energy Audit Report. Deliver final audit report to State for approval. Execute Exhibit B to the TEAPP.

10) Proposal. Prepare an Energy Performance Contract Proposal using the State Energy Performance Contract documents. In anticipation of Contractor and State entering into an Energy Performance Contract to design, install, and monitor the energy and water saving measures proposed in the Technical Energy Audit Report, Contractor shall prepare a proposal to be incorporated in an Energy Performance contract that includes the following:

a. Project Cost is the maximum not to exceed amount State shall pay for the project and Contractor’s services. Costs must be consistent with mutually agreed to markups and fees established in **Exhibit D** to the TEAPP. Costs may include but are not limited to: engineering, designing, packaging, procuring, installing (from Technical Energy Audit Report results); performance/payment bond costs; construction management fees; commissioning costs; maintenance fees; monitoring fees; training fees; and overhead and profit.

b. Include a List of Services that shall be provided as related to each cost.

c. Expected term of the Energy Performance Contract.

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- d.** Expected utility rate forecast (escalation or decline) based on historical trends, utility provider rate forecasts, economic forces of supply and demand (global, national, local or regional), natural resource availability, technology, utility capital investment, and environmental requirements. (GEO and/or the Office of the State Architect shall be consulted on the appropriate fuel price escalation factors for all projects.)
- e.** Description of how the project shall be financed including available interest rates and financing terms, based on interest rates likely available to State at this time, and based on a 60-day and 90-day lock option.
- f.** Explanation of how the savings shall be calculated and adjusted due to weather (such as heating and cooling degree days), occupancy or other factors. Monitoring and verification methods must be consistent with the most current IPMVP.
- g.** Analysis of annual cash flow for State during the contract term.